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Abstract

Heifers fed low energy diets gained less before calving, took longer from calving to first estrus, and dropped lighter calves. Their conception rates were lower and fewer showed estrus the first 20 days of breeding. Rumensin lengthened the time from calving to estrus with no effect on calf birth weight, milk production, or percentage of calves weaned. However, calves from heifers fed Rumensin gained faster. Long-term Rumensin feeding to heifers (from weaning through second breeding) increased weight gain and hastened puberty with no effect on reproductive performance. Rumensin-fed dams tended to wean heavier calves.

Keywords

Cattlemen's Day, 1981; Report of progress (Kansas State University. Agricultural Experiment Station); 394; Beef; Energy; Reproductive performance; Heifers

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The Effects of Rumensin® and Two Levels of Energy Prior to Calving on Reproductive Performance in First Calf Heifers

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Summary

Heifers fed low energy diets gained less before calving, took longer from calving to first estrus, and dropped lighter calves. Their conception rates were lower and fewer showed estrus the first 20 days of breeding.

Rumensin lengthened the time from calving to estrus with no effect on calf birth weight, milk production, or percentage of calves weaned. However, calves from heifers fed Rumensin gained faster. Long-term Rumensin feeding to heifers (from weaning through second breeding) increased weight gain and hastened puberty with no effect on reproductive performance. Rumensin-fed dams tended to wean heavier calves.

Introduction

Low energy levels prior to calving reduce subsequent reproductive performance in beef heifers. Rumensin improves performance of growing and feedlot cattle, but little data exists on its effects on heifers or cows. Our trial determined the effect of Rumensin and two levels of energy prior to calving on subsequent reproductive and calf performance.

Procedure

Two groups of pregnant Angus and Angus x Hereford heifers were confined to drylot. One group (70 head) received no Rumensin; the other (65 head) received 200 mg Rumensin per head per day from weaning through calving and subsequent breeding. Half of each group received either 7.53 Mcal ME (low energy) or 11.41 Mcal ME (high energy) per head per day for 100 days prior to the start of calving. At calving, all heifers received 23 Mcal ME per head per day. We estimated calving difficulty (1=no assistance, 2=easy pull, 3=hard pull, 4=caesarean section), weighed all calves at birth, and observed cows for estrus twice daily beginning 20 days after the calving season started. Cows were artificially inseminated during the 60-day breeding season by one technician using semen from a highly fertile bull. Milk production was measured by the weigh-suckle-weigh technique. Only heifers that weaned a calf (101 head) were included in the reproductive data.

®Rumensin, product of Elanco Products Co., Indianapolis, IN 46706

Results and Discussion

Cows on low precalving energy gained less weight during the 100 day precalving period, lost more condition, weighed less at calving, and dropped lighter calves (Table 17.1). Furthermore, they tended to wean fewer calves, had longer postcalving intervals to estrus, lower pregnancy rates, and fewer showed estrus the first 20 days of the breeding season (Table 17.2).

Rumensin had no effect on precalving weight gain and body condition change (Table 17.3), but lengthened postcalving interval to estrus (Table 17.4), which contradicts other research work. Fewer cows fed Rumensin showed estrus in the first 20 days of breeding (Table 17.4). No other Rumensin effect on reproduction was noted. Calves born to dams fed Rumensin outgained calves from control dams (Table 17.3) and Rumensin-fed heifers produced slightly more milk.

Heifers in this study received Rumensin 630 days, with the effects during various periods shown in Table 17.5. Rumensin improved average daily gain and tended to shorten the time to puberty. For the 130 days following the first breeding, Rumensin significantly improved weight gain but this trend declined the last 100 days before calving. Following calving, Rumensin did not improve gain. We concluded that prolonged Rumensin feeding had no effect on reproductive performance in heifers.

Table 17.1. Effects of precalving energy level on weight gain and body condition.

	Energy Level	
	Low (7.53 Mcal ME/hd/day)	High (11.41 Mcal ME/hd/day)
No. of cows	67	68
Precalving average daily gain (lbs)	-0.35[a]	0.81[b]
Body condition at start	6.5	6.6
Body condition at calving	4.4[a]	5.3[b]
Postcalving weight (lb)	776.2[a]	869.6[b]
Degree of calving difficulty	1.51	1.66
Milk production in 24 hours (lbs)	12.1	10.7
Calf birth weight (lbs)	60.1[a]	64.2[b]
Calf average daily gain to 120 days of age (lbs)	1.12	1.19
Percent calves weaned	69.7	73.5

[a,b]Values in the same row with different superscripts differ signigicantly ($P<.05$).

Table 17.2. Effects of precalving energy level on reproductive performance.

	Energy Level (7.53 Mcal ME/hd/day)	Energy Level (11.41 Mcal ME/hd/day)
Number of cows	51	50
Postcalving interval to estrus (days)	63[a]	51[b]
Percent first service conception	64.7	62.0
Services/conception	1.51	1.71
Percent pregnant	74.5[c]	88.0[d]
Average time of conception from calving (days)	92.1	90.7
Percent in estrus by days after start of breeding: 20	66.6[a]	86.0[b]
40	86.2	98.0
60	98.0	98.0

[a,b]Values in the same row with different superscripts differ significantly ($P<.05$) [c,d]($P<.08$).

Table 17.3. Effects of Rumensin on weight gain and body condition.

	Treatment Control	Treatment Rumensin
Number of animals	70	65
Precalving average daily gain (lbs)	0.20	0.29
Precalving body condition change	-1.59	-1.83
Postcalving body condition change	0.47	0.45
Postcalving average daily gain (lbs)	0.62	0.51
Degree of calving difficulty	1.58	1.60
Milk production in 24 hrs. (lbs)	11.22	12.32
Calf birth weight (lbs)	62.0	62.2
Calf average daily gain to 120 days of age (lbs)	1.14[a]	1.30[b]
Adjusted weaning weight (lbs)	375.1	393.6
Percent calves weaned	71.0	72.3

[a,b]Values in the same row with different superscripts differ significantly ($P<.05$).

Table 17.4. Effects of Rumensin on reproductive performance.

	Treatment	
	Control	Rumensin
Number of cows	53	48
Postcalving interval (days) to estrus	50[a]	65[b]
Percent first service conception	60.3	66.6
Services/conception	1.67	1.56
Percent pregnant	81.1	81.3
Average time of conception from calving (days)	88.1	94.7
Percent in estrus by days after start of breeding: 20	83.3[a]	64.5[b]
40	92.5	91.6
60	98.1	98.0

[a,b]Values in the same row with different superscripts differ significantly ($P<.05$)

Table 17.5. Long-term effects of Rumensin on heifer weight gains and performance.

	Treatment	
	Control	Rumensin
Daily weight gain, lbs		
Weaning through breeding	1.38[a]	1.48[b]
Breeding to 100 days precalving	.68[a]	.81[b]
100 days precalving	.20	.29
Postcalving	.62	.51
Age at puberty (days)	367.5	356.7

[a,b]Values in the same row with different superscripts differ significantly ($P<.05$)